Manufacturing Cost (Production Cost)

Cost during steady state ———→ DPC + IPC   ┌ for adv...
production   ┌ variable   ──→ Sales + Distribution
                                  └ fixed   ──→ Research & Develop.
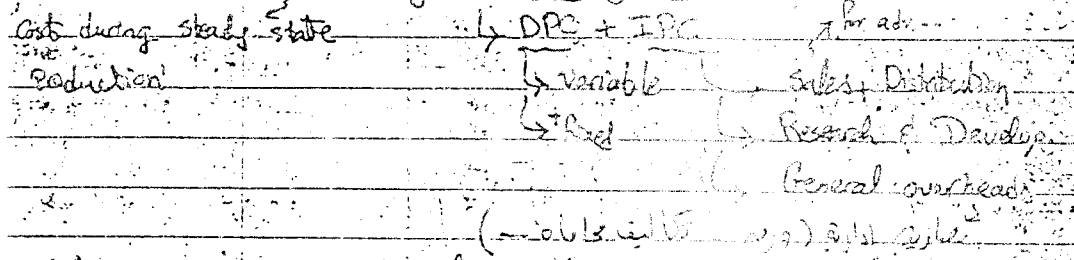   General overheads

(............)

These costs are covered through sales

Details about such costs:

DPC: Direct Production costs (directly related to the
                                  production process)

IPC: Indirect Production Costs (spent during production but
                          not directly on production. Adv,
                          marketing, R&D

Estimates :1.   IPC ≈ 20-30% DPC

       2. or   Sales + Distribution = 5% TPC   ┌─────────────────┐
                                                 │ TPC = DPC + IPC │
               Research & Develop =   │ total Prod. Cost│
                                                 └─────────────────┘

               General overheads = 2%   ┌ [Labor + Maintenance]
                      already known   └── Supervising

both estimation methods can work

→ ex: prob. 3 Sheet 1 :-

       Given: TCI = $1,500,000   = FCI + WCI

               production: $3×10^6 Kg , selling price = $0.83/Kg

               WCI = 15/60 TCI

Packaging: $0.03/Kg, R.M: $0.09/Kg, Labor: $0.08/Kg, Utilities: $0.05/Kg

               Distribution Cost : 5 TPC
               No Interest is charged

       Find: Prod. Cost/Kg product →

Sol: (we'll work per kg)

$WCI = 15\% \ TCI \rightarrow \therefore FCI = 85\% \ TCI$

$\therefore FCI = 0.85 \times \$1500000$

$FCI \ per \ Kg = 0.85 \times \$1500000 / (3 \times 10^6)$

Manfacturing Cost $= DPC + IPC$

DPC:

(1) variable Cost:

   Raw mat. $= \$0.09/Kg$

   Misc. (casting, lab mat...) $= 0.1 \times Maintenance \quad (\leftarrow 10\%)$

   Utilities $= \$0.05/Kg$

   Shipping + Packaging $= \$0.008/Kg$

2) Fixed Cost:

   Maintenance $= 5-10\%$ of $FCI \ per \ Kg$

   $\hookrightarrow$ now we can get the Misc mat Cost

   Labor $= \$0.08/Kg$

   Supervision $= 20\%$ of labor

TPC

Total Maning cost = DPC + 5% TPC + 5% TPC = 70% (Labor, Superv. + Maint.)

$$\text{Manufg cost} = \frac{DPC + IPC}{kg}$$

$$\downarrow$$

$$TPC = \frac{TPC}{kg} \times 3 \times 10^6$$

$$Profit = 0.82 - \frac{TPC}{kg}$$

$$FCI/_{100 lb} = \frac{2 \times 10^6}{10 \times 10^6} \times 100$$

$$= \$20/_{100 lb}$$

Man. cost/100 lb of prod.

$FCI = \$ 2 \times 10^6$

Prod = 10×10^6 lb

$$Manufg \; cost/_{100 lb} = DPC + IPC$$

R.M. = $\$0.12/lb$

DPC ⟶ Variable
      ⟶ Fixed cost

Water = 10 gal/lb prod — $\$55/_{1000 gal}$

Steam = 50 lb/lb prod — ($\$1.5/_{1000 lb}$)

Variable:

Electricity = 0.4 Kwh/lb prod ($0.05/kwh$)

$/_{100 lb}$

Labor = 20 men at $\$8/hr$

R.M. = 0.12 × 100

Plant operates 300 day, 24 hr/yr

Miscell. Mat. = 0.1 × Maint

Plant overhead = 50% (Labor + Sup + Maint)

Utilities = $10 \times 100 \times \frac{0.55}{1000} + 50 \times 100 \times \frac{1.5}{1000} + electricity$

⟶ $0.4 \times 100 \times 0.05$

Packaging neg.

Fixed:

Labor = $8 \times \frac{24}{3} \times 20 \times 3 \times 300 = $ ⟶ 10×10^6 lb prod

⟶ 100 lb prod

$\times 10^{-5}$

Supervision $= 0.2$ labor

Plant overheads $= 0.5$(labor + sup$_n$ + maint.)

Maint. $= (5\text{-}(6)\%)\left(\dfrac{FCI}{100\,lb}\right)$

↳ $\approx$ corrosive liq.

Interest $=$ neg.

Insurance $= 0.01$ $\dfrac{FCI}{100\,lb}$

Royalties $=$ neg.

Depreciation $= 0.15\left(\dfrac{FCI}{100\,lb}\right)$

$\Sigma = DPC$

$TPC/100\,lb\,prod = DPC + SPC$

$\{40\}$ if not mentioned $\leftarrow$ $\begin{matrix} R\&D \\ sales \\ admin \, O.H \end{matrix}$

$\times DPC$